*SCIENTIFIC NOTE*

# Evaluation of Trimedlure Bait Field Duration under Florida Field Conditions

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**Abstract**. A study was conducted to determine the effect of trimedlure (TML) bait field duration on recovery of sterile male Mediterranean fruit flies, *Ceratitis capitata* (Wiedemann) under west central Florida conditions. Jackson traps baited with TML soft plugs were placed in residential (N = 80) and industrial (N = 40) settings, then monitored weekly. Traps were monitored to determine if TML bait at three- or six-week field duration had a greater attractiveness towards *C. capitata*. In all but one instance, traps with three-week field duration achieved higher *C. capitata* yield than traps baited in the field for six weeks. However, no significant difference ($P > 0.05$) was found in trap yield as a result of bait age. Given these data, maintaining Jackson traps on six-week duration bait is more cost effective with no significant recovery loss due to attractiveness to sterile release *C. capitata* in a residential setting.

**Key words:** *Ceratitis capitata*, trimedlure, sterile insect technique, bait duration

The Mediterranean fruit fly, *Ceratitis capitata* (Wiedemann) poses a substantial threat to citrus-based agriculture of Florida (Warthen et al. 1999, Warthen et al. 1997, Liquido et al. 1991, Leonhardt et al. 1989). In response to this, a Preventive Release Program (PRP) has been established in several critical areas of the state. The protocol of this project includes extensive statewide monitoring for early detection and use of sterile insect technique (S.I.T.) in historic outbreak locations. The Jackson trap (Harris et al. 1971), baited with a 2 g trimedlure soft plug (TML) *tert*-butyl 4- and 5-chloro-2-methyl cyclohexane-1-carboxylate (Beroza et al. 1961), is considered the standard for *C. capitata* detection and is the most widely used trap in the Florida *C. capitata* program and elsewhere (Warthen et al. 1999). If found comparable in attractiveness to *C. capitata* at a longer field duration, then a new bait replacement schedule would have substantial cost-effectiveness implementations.

Transects (N = 3) were established within the *C. capitata* PRP area of Tampa, Florida (Hillsborough Co.). Two of these treatments were located in residential areas, similar in habitat, containing citrus hosts, such as loquat, grapefruit and a variety of non-hosts, predominantly oaks. A third site was chosen and initiated three weeks after these first two, this site located in an industrial area with a few scattered residences, near Tampa International Airport. It contained a much lower density of vegetation and limited host availability.

Standard Jackson traps (N = 40) baited with TML soft plugs (Lot 60111169, Scentry) were placed, at 100 m intervals along each of five streets at each of three transects. Ten traps were placed along each street. Traps were visited weekly to check status and provide fresh capture media (glue) and remove collected insects. During the third and sixth week *C. capitata* recovery data were collected for comparison. After each recovery the six-week field visit traps were replaced with fresh TML bait to begin a new replicate. Five replicates

**Table 1. Comparison of average *Ceratitis capitata* yield per trap and per site at 3- and 6-week field duration based on five–six week replicates in Tampa, Florida between May 26–December 15, 2000 and June 15–November 24, 2000 for sites 1 + 2 and site 3, respectively.**

| | | Bait field duration | | |
|---|---|---|---|---|
| Transect | n | 3 weeks | 6 weeks | *P* |
| Site 1 | 20 | 15.8 ± 2.7 | 12.5 ± 2.1 | 0.5629 |
| Site 2 | 20 | 18.3 ± 3.9 | 16.4 ± 2.9 | 0.4753 |
| Site 3 | 20 | 15.3 ± 2.9 | 14.3 ± 2.9 | 0.4256 |

were conducted during this study in the residential areas (sites 1 and 2) (26 May- 15 December, 2000) and four were conducted in the industrial area (site 3). (15 June – November, 2000) Data at each site was analyzed (using Wilcoxon Rank and Sum) to determine if significant differences in *C. capitata* catch were evident as a result of bait duration in the field at three or six weeks (SAS Institute, 2000).

Table 1 shows the average *C. capitata* catch for 3- and 6- week duration baited traps at the conclusion of each six-week repetition. Average *C. capitata* yield per trap, appeared to be lower beyond 3-week bait duration at all sites, with the Jackson traps catching slightly more flies at 3-week field duration than at 6-week duration baits, but this difference was not significant ($P > 0.05$). The fresher 3-week field duration TML baits maintained fly per trap yield of 15.3 to 18.3 among the three sites. The longer 6-week field duration TML bait maintained fly per trap yields of 12.5 to 16.4 among all sites. No significant differences were found in fly recovery yields between sites.

Warthen et al. (1999) conducted similar field studies in Hawaii and California that indicated no significant differences in fly capture as a result of bait age over a six-week period. Furthermore, their studies demonstrated that the residual trimedlure levels remaining from the initial 2g plug changed only slightly beyond 2-week field exposure. Given these data and the results detailed in the present study, as well as the potential cost savings, it appears that a 6-week duration bait would be both economically desirable and adequate in the field for fly detection.

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